

Nandeva, gen. nov., a new genus of Chironomini

(Insecta, Diptera, Chironomidae)

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Nandeva, a new genus of Chironomini is established. *Nandeva gaucha*, spec. nov. is described based on the pupa and male imago, two additional species, *Nandeva tropica*, spec. nov. and *N. chilena*, spec. nov. are described based on the pupae only. The larval stages are unknown. *Nandeva gaucha*, spec. nov. is found in southern Brazil, *N. tropica*, spec. nov. in the Amazon basin and in Rio de Janeiro State, and *N. chilena*, spec. nov. in southern Chile.

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Introduction

The fauna of chironomids in tropical South America is extraordinarily rich in species, hundreds of undiscovered species can be expected to exist (Spies & Reiss 1996). In 1994 the authors found an unknown pupal exuvia morphotype in small rivers of a mountainous region in southern Brazil. Fortunately, reliably associated adults were also found allowing us to describe the new genus. Two other morphotypes in the pupal stage, found in the collection of the Zoologische Staatssammlung München, are included in the genus and described as species. One of the latter was outlined by Ospina Torres (1992) as a new “genus 30”.

The larvae are unknown, and for this reason the diagnoses of the genus and species remain incomplete, and statements on the species' ecology are not possible.

Terminology used follows Saether (1980). The type material is deposited in the Zoologische Staatssammlung München (ZSM), Germany, Coleção Entomológica do Instituto Oswaldo Cruz (IOC), Rio de Janeiro, Brazil, and in the personal collection of Dr. F. Reiss.

Nandeva, gen. nov.

Type species. *Nandeva gaucha*, spec. nov., by present designation.

Etymology. This genus is dedicated to the native Indian group that formerly lived in the region where the type material was found.

Description

Adult ♂. Based on the type species and a few specifically unassigned adult males (see *Nandeva* spec.). Small species, body length about 2 mm.

Head. Antenna with 13 flagellomeres, fully plumose. AR less than 0.4. Eyes bare, reniform. Frontal setae merging into orbitals. Clypeus triangular, moderately setose. Palp 5-segmented.

Thorax (Fig. 1A). Anteprenotal lobes slightly tapered dorsally, ending very distant from each other below apex of mesonotum. Scutum slightly overreaching anteprenotum, tubercle lacking. Anteprenotals, acrostichals, dorsocentrals, prealars and scutellars present. Dorsocentrals proximally uniserial, distally biserial; acrostichals biserial; scutellars biserial, the oral row of smaller setae.

Wing (Fig. 1B). All veins with setae, membrane with setae and trichia. Anal lobe absent. Squama with 2 to 4 setae. Costa not extended beyond R_{4+5r} , ending distal to Cu_1 .

Legs. Apex of fore tibia (Fig. 2C) with a short scale bearing a long and slightly curved spur. Mid and hind tibia (Fig. 2D, E) with separate combs, inner comb bearing a longer spine than the outer.

Hypopygium (Figs 3A, B). Anal tergite bands fine, well separated, extending over $\frac{2}{3}$ of the anal tergite. Basal-lateral setae of anal tergite long and strong, median anal tergite setae absent. Many (12-22) long setae arranged around the anal point insertion. Anal point long, narrow, parallel-sided and curved to ventral. Superior volsella without microtrichia, digitiform, with a strong broadened base, with 0-1 basal-median, 1-3 basal-lateral setae and three short setae at the apex, sometimes one of the latter near middle of median margin. Median volsella absent. Inferior volsella parallel-sided or narrowed in apical $\frac{1}{2}$; dorsal surface with medially directed macrotrichia and few long setae; two long, slightly curved setae apically, one of them oriented to dorsal. Median contour of gonocoxite with 4 long setae. Gonostylus cylindrical, slender, microtrichiose, except on basal $\frac{2}{3}$ of the median contour; gonostylus with anteriorly directed short setae on the medially oriented part of the distal half, long setae absent in this region.

♀ known, but not described.

Pupa. Length 2-3 mm.

Color. Exuviae greyish.

Cephalothorax (Figs 4A, B). Frontal setae 0, postorbitals 0, median anteprenotals 2, lateral anteprenotals 1 and 1 pit, prealars 0, precornae 2 and one pit, dorsocentrals 4 in two pairs. Thoracic horn and cephalic tubercles absent. Fore and mid leg sheath straight between and reaching beyond wing sheaths. Hind leg sheath S-shaped, lying under the wing sheath as in Type 5, "Lepidopodites", of Brundin (1966: fig. 627 and p. 430).

Abdomen (Fig. 5). Pedes spurii A and B absent. Tergites: I bare. II-V each with postero-median row of hooklets, rows slightly longer on segment IV. II-VII each with an oral pair of broad, rectangular spine patches. The latter can be fused in *N. chilena*. Tergites II-VIII irregularly covered with shagreen. Segment IX sometimes with one pair of setae. Anal lobe reduced, fringe absent. Male genital sac extending beyond the anal lobe.

Larva. Unknown.

Differential diagnosis. The following combination distinguishes the adults of *Nandeva* from other Chironomini: Superior volsella with 0-1 basal-median setae, 1-3 basal-lateral and three short setae at the apex, sometimes one of the latter near the middle of median margin; median volsella and median anal tergite setae absent; anal point parallel-sided and slender; wing with membrane and veins hairy, squama with 2-4 setae, anal lobe absent.

The presence of paired patches of spines on tergites II-VII, and of hooklet rows from II-V in combination with the absence of an anal lobe fringe, anal spur or comb, thoracic horn, and of pedes spurii A and B will distinguish the pupae of *Nandeva* from all other Chironomini.

Nandeva gaucha, spec. nov.

Types. Holotype: 1 pharate ♂ pupa, BRAZIL, Rio Grande do Sul, município Bom Jesus, X.1961, leg. E. J. Fittkau (ZSM). – Paratypes: BRAZIL, Rio Grande do Sul, São Francisco de Paula, Arroio dos Carros, XI.1994, leg. S. Wiedenbrug, 14♂♂, 7 pupal exuviae (ZSM) and 3♂♂, 6 pupal exuviae (IOC); 1♂, Arroio da Estação Ecológica da Puc, XI.1994, leg. S. Wiedenbrug (IOC).

Etymology. Named from the Brazilian word for the natives of Rio Grande do Sul.

Description (Measurements given as means in μm).

♂ (Genus characters mostly not repeated).

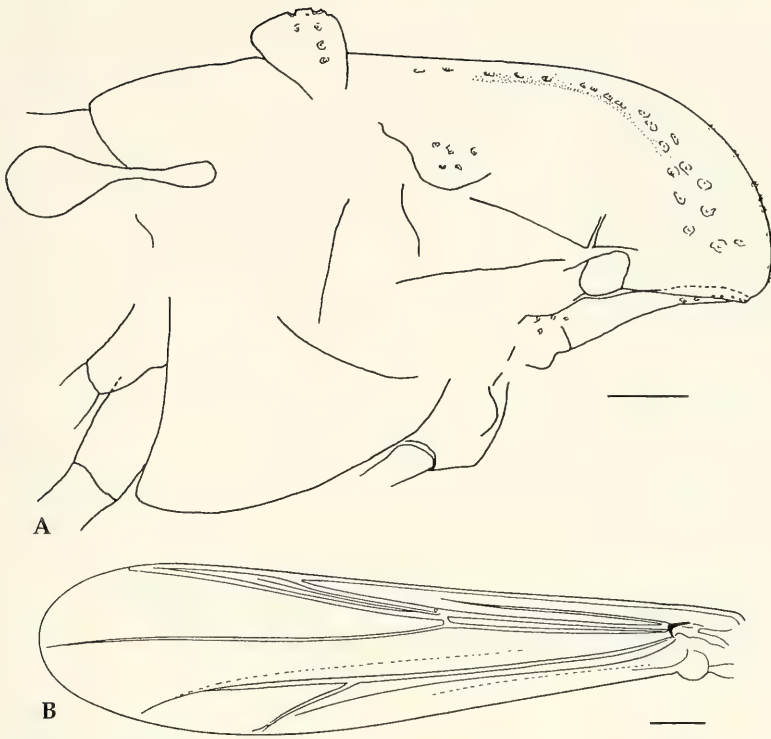


Fig. 1. *Nandeva gaucha*, spec. nov. Adult ♂. A. Thorax, lateral. B. Wing, figured without setation. Scales: 100 μ m.

Color (in alcohol). Thorax brown, scutellum pale; abdominal tergites (Fig. 2A) II-V and VIII brown, VI and VII brown with a clear postero-median mark, tergal setae originating from small pale spots. Abdominal sternites pale.

Length. Thorax 670 (620-780, n=10). Abdomen 1510 (1390-1810, n=9).

Head. Frontal setae 4-7, verticals 2-4. AR 0.23 (0.19-0.30, n=12). Antenna with one subapical seta present. Clypeus with 12 setae (9-16, n=15). Lengths of palpal segments 1-5 (n=12): 30, 40, 230, 210, 230.

Thorax (Fig. 1A). Lateral anteprenotals 5 (3-8, n=11), median anteprenotals 7 (5-9, n=12), acrostichals 20 (17-22, n=10), dorsocentrals 20 (18-25, n=16), prealars 6 (5-7, n=16), scutellars 12 (9-15, n=12).

Wing (Fig. 1B). Length 1170 (1100-1240, n=10), width 310 (290-330, n=10). Squama with 3 setae (n=11). Brachiolum with 5 setae; number of setae on C about 150, R 28, R₁ 28, R₄₊₅ 25, M 13, M₁₊₂ 22, Cu 40, M₃₊₄ 31, Cu₁ 14 (n=1).

Legs. Spurs and combs as in Figs. 2C, D, E. Sensilla chaetica and pulvilli absent. Two types of setae on the last tarsomeres, one straight, the other curved and relatively broad.

Length of leg segments and proportions:

	Fe	Ti	Ta1	Ta2	Ta3	Ta4	Ta5	LR	BV	SV
PI	290	280	220	140	110	90	50	0.83	2.04	2.44
n	12	12	2	2	2	2	2			
PII	330	280	170	110	100	60	50	0.62	2.42	3.50
n	13	13	3	3	3	3	3			
PIII	330	360	200	150	140	90	50	0.57	2.05	3.29
n	15	15	3	3	3	3	3			

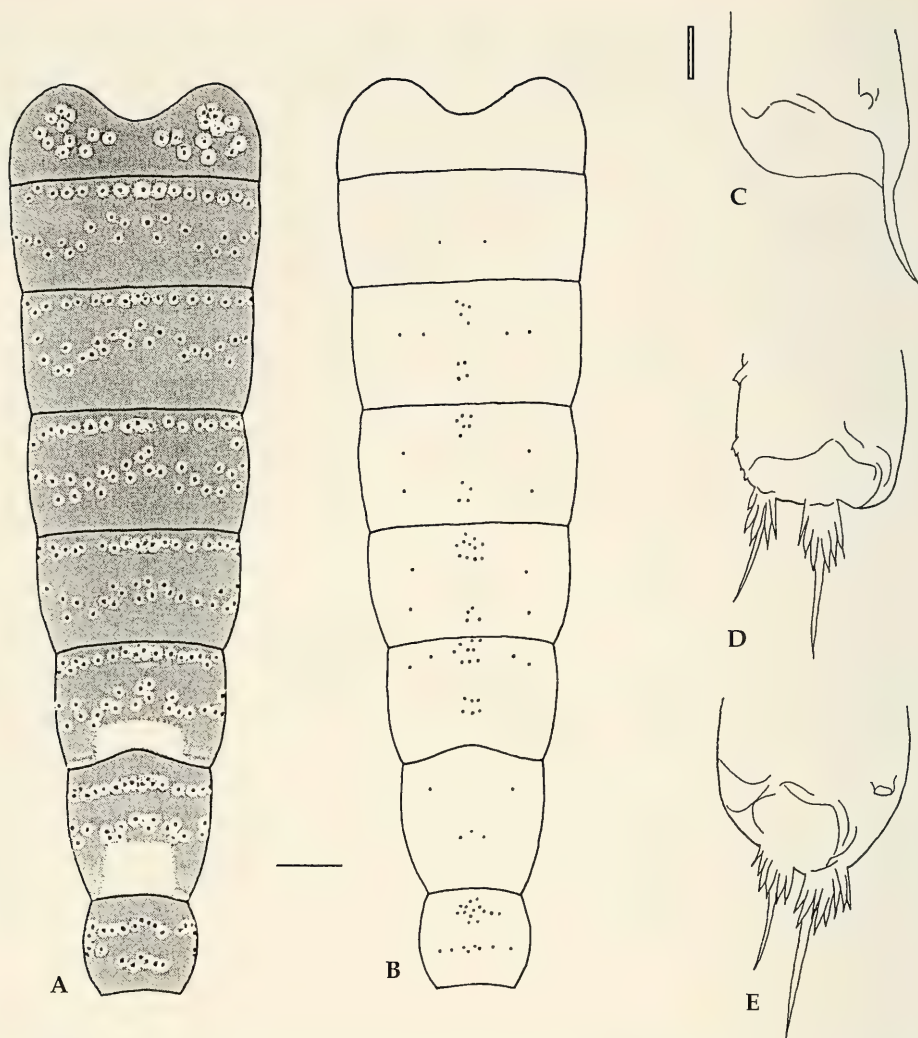


Fig. 2. *Nandeva gaucha*, spec. nov. Adult ♂. A. Tergites I-VIII. B. Sternites I-VIII. C. Fore tibial apex. D. Mid tibial apex. E. Hind tibial apex. Scales: simple 100 μ m, double 10 μ m.

Abdomen (Figs 2A, B). Tergite I with scattered setae, II-VIII each with a row of basal setae. Two irregular median transverse rows of setae each from segment II-VI or VII, one transverse median row on VIII. Sternite II with a median pair of setae. SIII-VI each with 2 median patches and a pair of lateral setae as in Fig 2B. VII with 1 median patch and one lateral seta. VIII with an anterior patch and a posterior transverse row of setae.

Hypopygium (Figs 3A, B). Gonocoxite length 130 (100-180, n=16), gonostylus length 180 (170-190, n=16). HR 0.73. About 17 (12-22, n=7) long setae in a field around anal point insertion. Superior volsella with one basal seta medially, two (rarely three) laterally, and three short apical setae; distal half of superior volsella ventrally excavated (Fig. 3C). Inferior volsella basally broad, apically narrow with outer margin slightly S-shaped. Dorsal surface with macrotrichia, about 7 (5-8, n=6) long, medially directed setae, and two apical setae, one directed to caudal, the other to dorsal. Ventral surface with short, caudally directed microtrichia, one seta directed laterally, one seta on the median margin, and one or two on the lateral margin. Gonostylus ventrally with 13 (11-16, n=6) short, anteriorly directed setae on the medially oriented part of the distal half. Sternapodeme M-shaped.

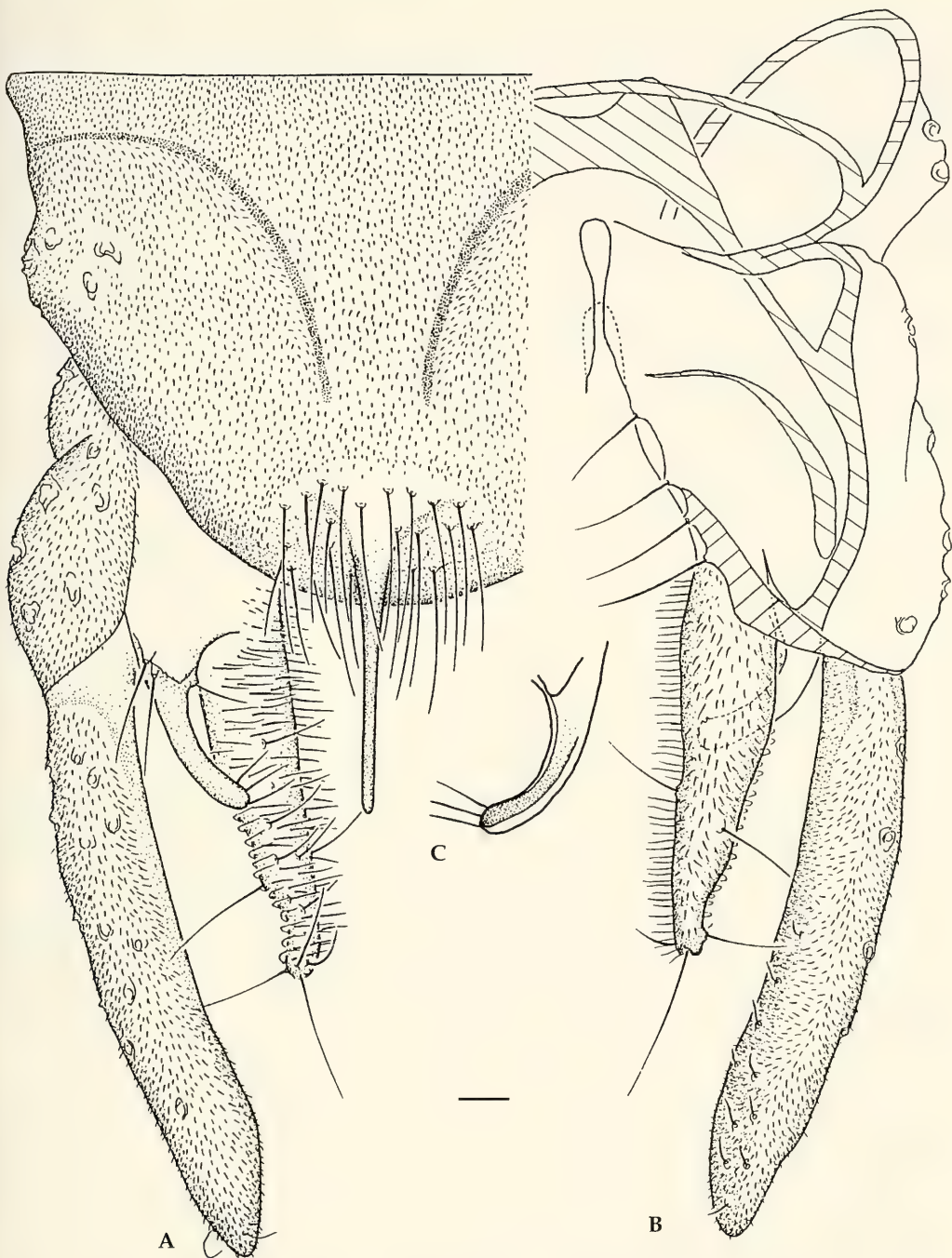


Fig. 3. *Nandeva gaucha*, spec. nov. Adult ♂. **A.** Hypopygium, dorsal. **B.** Hypopygium, ventral. **C.** Superior volsella, ventral. Scale: 10 μm .

♀ known, but not described.

Differential diagnosis. Superior volsella with 3 distal setae concentrated at the apex. Inferior volsella apically narrowed. Otherwise refer to generic diagnosis.

Pupa. (Genus characters not repeated).

Length. Thorax 740 (650-780, n=11, Figs. 4A, B); abdomen 1790 (1700-1870, n=7).

Abdomen (Fig. 5D). Setae of segments I-VIII:

	I	II	III	IV	V	VI	VII	VIII
dorsal	2+2 ¹	3+2 ¹	4+2 ¹	4+2 ¹	4+2 ¹	4+2 ¹	4+2 ¹	1
lateral	2	2	2	2	2	2	2	1 ²
ventral	2	2	2	2	2	2	2	1 ³

¹ Additional dorsal pits not bearing setae in the specimens examined.

² Intersegmental between VIII and IX.

² and ³ Not always present.

Tergites. I bare with a posterior band of greyish polygons (Fig. 5E). II to VI with bands of polygons each ending in a black spine (Fig. 5F).

Sternites. Bare, VII and VIII with light shagreen.

Segment IX (Figs 5D, G). Tergite with anterior shagreen. Male genital sac wide in midsection, pointed at the tip.

Larva. Unknown.

Differential diagnosis. See key below.

Nandeva tropica, spec. nov.

“Gattung 30” spec. 1, “Puppenexuvien-Typ” 163, Ospina Torres 1992

Types (all pupal exuviae). Holotype: 1, BRAZIL, Amazonas, Rio Marauíá, left side affluent to upper Rio Negro, 29.I.1963, leg. E. J. Fittkau (ZSM). – Paratypes (leg. E. J. Fittkau): 2, BRAZIL, Pará, upper course of Rio Parú do Oeste, Serra Tumucumaque, near border to Surinam, 22.III.1962 (IOC); 3, Amazonas, Rio Marauíá, left side affluent to upper Rio Negro, near border to Venezuela, mountainous region Chamata, 17. and 29.I.1963 (ZSM); 1, Amazonas, Rio Marauíá, I.1963 (ZSM); 2, Amazonas, Rio Irapirapi, affluent to Rio Marauíá, border to Venezuela, 12.I.1963 (ZSM); 1, Amazonas, Igarapé Acará near Manaus, 26.VI.1961 (IOC), see Ospina Torres (1992: fig.1 and p.3); 1, Mato Grosso, Serra dos Parecis, X.1965 (ZSM); 3, Maranhão, Res. Aldeia Escalvado, 6°S, 54°W, 8.IV.1991 (IOC); 1, Rio de Janeiro, Nova Friburgo, Caledonia (reservoir), Rio Cascatinha, 24.VIII.1995 (ZSM).

Variation. 1, Amazonas, Rio Aripuana, left side affluent to lower Madeira, 16.I.1965 (ZSM); 1, Mato Grosso, Serra dos Parecis, X.1965 (ZSM); 1, Maranhão, Res. Aldeia Escalvado, 6°S, 54°W, 8.IV.1991 (ZSM).

Etymology. Named according to the known distribution of the species in South America.

Description

Pupa. (Genus characters not repeated)

Length (n=7). Thorax 661 (562-785). Abdomen 1636 (1510-1817).

Abdominal setation. 3 dorsals and 2 pits, one lateral and 2 ventral setae on segment I; II-VII as in *Nandeva gaucha*; VIII with 1 dorsal and 1 lateral or ventral (Fig. 5A). Tergites each with a posterior band of diffuse greyish spots each ending in 2 or 3 spines on TII-TV, in one or two spines on VI (Fig. 5B). Sternites bare.

Shagreen and setae present on tergite IX. Male genital sac narrow and tapered (Fig 5C).

Variation. Additional specimens, although fitting the description of *N. tropica*, differ slightly in the distribution of spines in the tergal patches. The spines from TII-III are grouped in pairs, rather than separate.

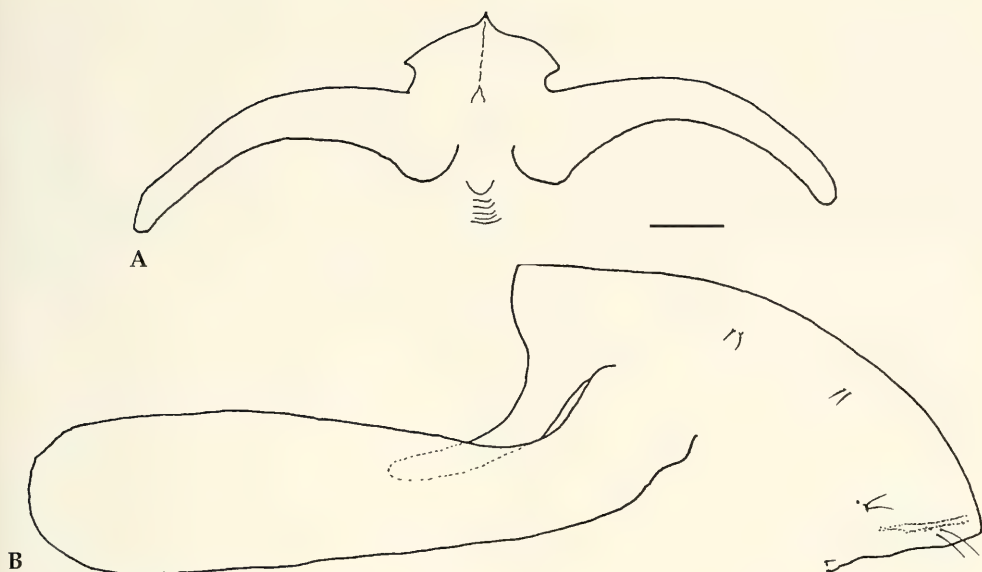


Fig. 4. *Nandeva gaucha*, spec. nov. Pupa. A. Frontal region. B. Thorax. Scale: 100 μ m.

Larva, ♂ and ♀ adult. Unknown.

Differential diagnosis. See key below.

Nandeva chilena, spec. nov.

Types (all pupal exuviae). Holotype: 1, South CHILE, Lago Todos los Santos, near Peulla, in front of mouth of Rio Bonito, 5.XII.1969, leg. F. Reiss (ZSM). – Paratypes: 7, from the type locality (2 at IOC, 5 in coll. Reiss).

Etymology. Named according to the known distribution of the species.

Description

Pupa ♀. (♂ unknown); genus characters not repeated.

Length. Thorax 819 (770-861, n=4). Abdomen 2267 (2160-2379, n=7).

Abdominal setation as in *Nandeva gaucha*, but segment VIII with two pairs of ventral setae and one additional lateral.

Abdominal spine patches II-III fused or almost fused, IV-VII fused (Fig. 5H). TII-VII with a posterior band of diffuse greyish spots each ending in one spine (Fig. 5I).

Segment IX without shagreen or setae.

Larva, ♂ and ♀ adult. Unknown.

Differential diagnosis. See key below.

Nandeva spec.

In the ZSM collection there are a few additional male adult specimens considered to represent the new genus, and consequently included in the generic diagnosis. However, this material is not regarded as suitable for a full species description, especially in light of the possibility for identity with one of the species described above.

These adults significantly differ from those of *N. gaucha*, spec. nov. by possessing superior volsellae with 1 of the distal setae located far proximal of the apex, and by the inferior volsellae being distally parallel-sided.

Distribution. Up to now *Nandeva*, gen. nov. is known from the Neotropics¹. The most northerly records are *Nandeva* spec. adults from Panama. The southernmost (*N. chilena*) are from South Chile. *N. tropica* is found in the Amazon basin: near the borders to Venezuela and Surinam, and near Manaus. *N. tropica* was also recorded in Rio de Janeiro state. *N. gaucha* is known only from Rio Grande do Sul.

Key to the known pupae of *Nandeva*

1. Abdominal tergites III-VII with the anterior spine patches fused or almost fused (Fig. 5H). Sternite VIII with 2 pairs of ventral setae. Segment IX without setae or shagreen (known only from ♀ P) *N. chilena*, spec. nov.
- TIII-VII with spine patches clearly separate (Figs 5A, D). Segment IX with setae and shagreen ... 2.
2. ♂ genital sac wide in midsection (Fig. 5G). Abdominal tergite I with posterior transverse band of polygons (Figs 5D, E). Similar bands on TII-VI composed of polygons each usually ending in 1 spine (Fig. 5F) *N. gaucha*, spec. nov.
- ♂ genital sac narrow (Fig. 5C). Tergite I band with pale polygons, or absent (Fig. 5A). Polygons in bands of TII-VI diffuse, each ending in 2-4 spines *N. tropica*, spec. nov.

Discussion

The absence of thoracic horn, anal lobe fringe, anal spur or comb, LS setae, and of pedes spurii A and B are reductions that could lead to the pupae being mistaken for Orthoclaadiinae. The presence of paired patches of spines on segment VII also, and of hooklet rows from segment II-V are considered autapomorphies for the genus. The 4 dorsal setae and 2 pits each on segments III-VII indicate the presence of originally 6 dorsal setae, one more than usually found in Chironomidae. A possible explanation is that one of the D-setae moved from an originally lateral position.

The adult characteristics show that the genus belongs to the Chironomini. In the key to the Chironominae of the Holarctic Region (Cranston et al. 1989), the males of *Nandeva* would key to *Pagastiella* Brundin, from which they differ by a wing without anal lobe, with 2-4 setae on the squama, and with hairy veins and membrane. Other marked differences are the fine anal tergite bands, narrow and parallel-sided anal point, and the absence of median anal tergite setae.

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¹ After completion of this manuscript Dr. Peter S. Cranston found a new species of *Nandeva* in Australia, which will be described in a future publication.

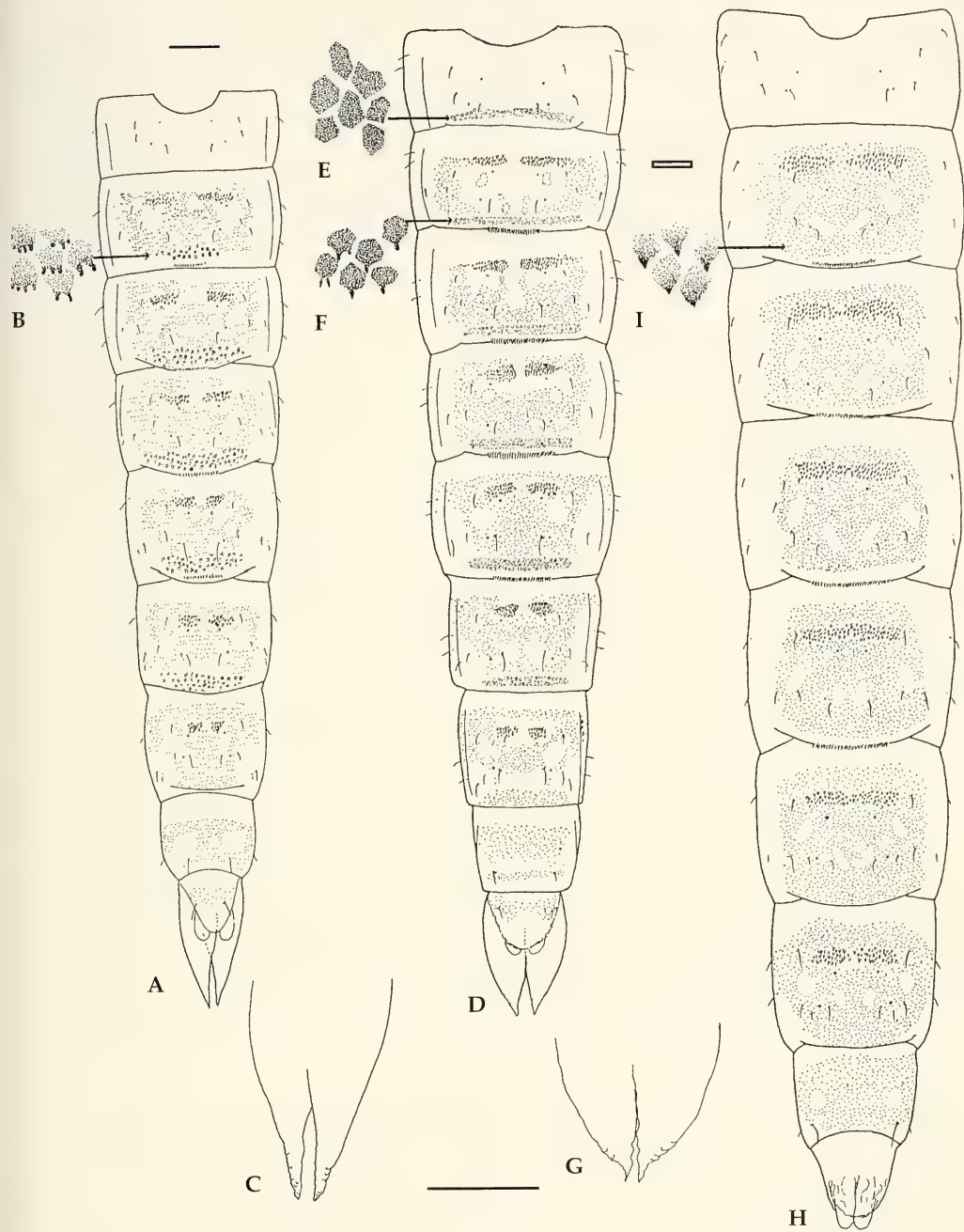


Fig. 5. A-C. *Nandeva tropica*, spec. nov. A. Abdomen, dorsal. B. Posterior spots on segment II. C. ♂ genital sac, ventral. D-G. *Nandeva gaucha*, spec. nov. D. Abdomen, dorsal. E. Posterior polygons on segment I. F. Posterior polygons on segment II. G. ♂ genital sac, ventral. H-I. *Nandeva chilena*, spec. nov. H. Abdomen, dorsal. I. Posterior spots on segment II. Scales: simple 100 μm , double 10 μm .

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